CHAPTER 1.0—PURPOSE AND NEED FOR THE RECOMMENDED ACTION

This Chapter is separated into the following sections:

1.0 INTRODUCTION

To respond to the present threat of uncharacteristically severe wildfire, the risk of increased insect activity, high fuel loads in the aftermath of wind damaged forest stands, and isolated small areas with unstable soils which may result in debris torrents from the consequence of storm events; the Forest Supervisor, published in the Federal Register, a Notice of Intent (NOI), on August 16, 1999 to prepare an Environmental Impact Statement with a purpose and need of improving ecosystem health on a landscape scale. A programmatic planning effort in the form of *Galena Watershed Ecosystem Analysis at the Watershed Scale* (EAWS[12]) encompassing the Galena Watershed portion of the Middle Fork of the John Day River was completed June, 1999 prior to the aforementioned NOI. A statement in the Galena EAWS (and hereafter referred to as the *Galena Watershed Analysis)* summarized watershed conditions, "A brief glance today at the watershed, could easily make one believe it is losing its resiliency due to large stand replacement wildfires, increased insect activity, blown down timber stands, and debris torrents in three streams," *(Galena Watershed Analysis*, Synthesis Summary page 4-49). The analysis completed in 1999 made specific recommendations for treatment which responds to undesirable conditions and characteristics found in the Galena Watershed including the analysis area of the *Southeast Galena Restoration, Draft Environmental Impact Statement* (this document (Galena WA, Supplement—2002)).

This watershed analysis shows that vegetation conditions of the analysis area are identical to conditions that caused the 37,961[13] acre 1996 Summit Fire which burned with uncharacteristically severe consequences compared to the magnitude of historic fire behavior. Extensive analysis from the *Summit Fire Recovery Project* is a part of baseline information in this document (Galena WA, Supplement—2002), the Malheur National Forest, *Summit Fire Recovery Final Supplemental Environmental Impact Statement* 1998. Restoration of the vegetation of forest stands across the analysis area would address similar vegetative conditions existing prior to the Summit Fire and propose treatment of forest stands in a manner that reduces the risk of uncharacteristically severe wildfire from occurring.

Three American Indian tribes retain rights in the Middle Fork area including: the Confederated Tribes of the Warm Springs Indian Reservation; Confederated Tribes of Umatilla Indian Reservation; and the Burns Paiute Tribe—all use the Malheur National Forest, for hunting, fishing, gathering, and religious purposes.

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[12] Following a federal procedure of *Ecosystem Analysis at the Watershed Scale*, as revised in Version 2.2 August, 1995

[13] All numbers in this document are approximate.

The *Southeast Galena Restoration*, as a project was already underway when on June 30, 1999, Oregon Governor John Kitzhaber, former USDA, Under Secretary, Dan Glickman and former USDA Forest Service Chief, Mike Dombeck announced the formation of an inter-governmental partnership of forty members. The Blue Mountains Demonstration Area (BMDA) is a collaborative effort focusing state, federal and local watershed restoration in a comprehensive strategy. The Demonstration Area focuses on three areas of the Blue Mountains (see Vicinity Map, opposite page 1 of this document (Galena WA, Supplement—2002)) including the Middle Fork of the John Day River. These lands are utilized by 20 communities within the Blue Mountains Demonstration Area. The *Southeast Galena Restoration,* as a project was a part of this Demonstration Area, and integrated the following collaborative goals of BMDA:

- **Goal Number 1—**Accelerate Forest and Watershed Restoration Activities.
- **Goal Number 2—**Work together through an integrated and collaborative landscape level approach.
- **Goal Number 3—**Contribute to the economic and social health of local communities.

In addition to these goals, the *Southeast Galena Restoration Project* also strived to accomplish many of the BMDA criteria including:

- Provide clean, cool water.
- Restore fish and wildlife habitats.
- Contribute to the recovery of threatened or endangered species.
- Promote sustainable and diverse forest conditions and improve forest health.
- Reduce the risks to property and forest resources from unnaturally severe wildfires.
- Limit the continuing spread of noxious weeds.
- Benefit local communities by providing employment opportunities.

In response to the above goals of BMDA and criteria, and recommendations brought forward from the *Galena Watershed Analysis 1999,* a concise description of a Forest Service recommended action is followed by the Purpose and Need which explains why this proposal was developed.

In addition to these goals, this project also endeavors to put into practice a good number of Oregon Governor John Kitzhaber's, "11-Point Strategy for Restoring Eastern Oregon Forests, Watersheds and Communities," (Kitzhaber, 2001).

1.1 Recommended Action

The total analysis area, encompassing seven subwatersheds, totaling 49,473 acres of the greater Galena Watershed—includes National Forest land and other ownerships. Recommended action, would occur only on federal land (see detailed descriptions of action recommended in Chapter 2.0—recommendations and a range of Alternatives, beginning on page 38). Some restorative activities from recommended actions to accomplish this landscape-scale project, may begin in 2003. Because safety and other factors must be applied on a project by project basis, it is estimated that fire prescriptions may take up to ten years to complete. In 3 to 5 years, projects such as prescribed fire will be evaluated to ensure management direction and intent are being met at that time. Table 2, Table 3, and Table 4, which begin on page 4 shows the types of projects and magnitudes of recommended action the forest service has analyzed as necessary to correct undesirable conditions (see 1.2.1 Undesired Conditions, page 8) in the analysis area.

Table 1 Subwatershed Acres

Subwatershed Name	Davis/ Placer	Vinegar	Vincent	Little Boulder/ ♥Deerhorn	Tin cup/ Little Butte	Butte	Granite Boulder	Totals
SWS Number	**30201**	**30203**	**30205**	**30207**	**30209**	**30211**	**30213**	
SWS Acres	7,462	7,585	3,769	10,983	7,430	4861	7,383	49,473
Malheur NF Acres	6,966	7,118	3,758	10,614	7,173	4,854	6,631	47,114
Acres in other National Forests	411 Wallowa Whitman						713 Umatilla	1,124
Private acres	496	56	11	369	257	7	39	1,235
(See Appendix "M" Map—1 Subwatersheds) ♥Some non-Forest Service maps show this as "Dearhorn"								

Aquatics Projects

While some riparian areas are slowly improving naturally, implementation of aquatic projects now, would begin accelerating conditions in a manner that threatened fish populations begin to benefit from an improved riparian environment at the time of implementation. Aquatic project activities would improve hydrologic/fisheries conditions such as: stream-channel stability; riparian shade; and the lack of a meandering nature the streams currently exhibit. These conditions collectively cause peak stream flows in early spring to allow too much water to leave the landscape too soon, with the consequence of low water flow and high water temperatures during late summer months. To improve hydrologic function and fisheries habitat, some projects within certain stream channels would be implemented by the use of heavy equipment. Project actions would improve hydrologic/fisheries conditions toward a properly functioning condition. These recommended actions would adhere to PACFISH /INFISH objectives and recovery strategy.

Vegetation Projects

This recommended action would initiate restoration management across the landscape: this includes 20% mechanical treatment by commercial harvest; 6% mechanical treatment by pre-commercial thinning; and prescribed burning on 47% of the analysis area. A number of projects are designed to move vegetative conditions such as forest stand structure and tree species mix toward an historic range. Prescribed fire and mechanical methods accomplish this transition. Mechanical methods include: commercial harvest implemented by tractor; skyline; and helicopter systems. Additionally, pre-commercial thinning would be used to implement vegetation prescriptions in order to improve and enhance the growth, quality, vigor, and resiliency of forest stands across the landscape. This includes intermediate treatments (generally small-diameter trees), within the Malheur National Forest *Land and Resource Management Plan*[14] designated Roadless Areas (LRMP Appendix C). A number of wood products including commercial timber, post and poles, pulp wood, fire wood, and other wood products such as biomass would be realized with these treatments.

Infrastructure Projects

Some roads or road segments that are currently located in Riparian Habitat Conservation Areas (RHCAs) would be relocated. The relocated roads or road segments would be constructed outside of the RHCA area, and then the old locations would be decommissioned. New roads would be constructed to access areas for prescribed vegetation management where necessary. Most of the new roads would be closed upon completion of project activities. Existing roads that are still needed to provide access for

[14] Malheur National Forest *Land and Resource Management Plan,* 1990 (also referred to as the Forest Plan and LRMP)

management or recreation would receive reconstruction or maintenance work needed to improve user safety and reduce road related impacts to other resources. Roads no longer needed for management or recreation access would be decommissioned and removed from the transportation system.

Table 2 Recommended Action—Aquatics Projects

Hydrology	
Streamside/Riparian Hardwood Protection	4 Miles/12 Acres
Streamside/Riparian Planting and Protection	16 Miles/16 Acres
Channel/Streamside Projects	90 Miles
Area Projects	1,450 Acres
Channel/Floodplain Rehabilitation	3 Miles/14 Acres
Fisheries	
New In-stream Structures	79 Structures
Improve Existing In-stream Structures	36 Structures
Riparian Planting (Plus work associated with in stream structure projects)	5.5 Miles
Culvert Removal or Replacement	2 Removal 1 Replacement

Table 3 Recommended Action—Vegetation Projects.

Harvest Prescription	
Commercial Thin	5,720 Acres
Commercial Thin in Connectivity Stands	1,230 Acres
Shelterwood	1,690 Acres
Salvage	250 Acres
Understory Removal	880 Acres
Pre-commercial Thin	2,160 Acres
Pre-commercial Thin in Connectivity Stands	950 Acres
Yarding Systems	
Tractor Skid	5,090 Acres
Skyline Skid	2,110 Acres
Helicopter Yard	2,670 Acres
Volumes Associated with a Timber Sale	44 MMBF (MMBF=Million Board Feet)
Other Wood Products (post & poles, firewood, chips, etc. from tractor ground only)	69 MBF (MBF=Thousand Board Feet)
Connected Projects	
New Roads	11.9 Miles
Removal of Undesirable Trees	2,570 Acres
Hand Line needed for Prescribed Burn Associated with Timber Sale	37.6 Miles
Machine Line needed for Prescribed Burn Associated with Timber Sale	11.6 Miles
Prescribed Burn Associated with Timber Sale	2,550 Acres
Hand Pile and Burn Associated with Timber Sale	1,850 Acres
Sub-Soil	1,248 Acres
Competing Vegetation Control (with herbicides)	900 Acres
Plant Conifer	1,930 Acres
Pocket Gopher Control (including pesticides)	1,690 Acres
Browse Control	1,690 Acres
Yard Tops	5,370 Acres
Reserve Tree Protection	20,230 Trees
Prescribed Fire	
Prescribed Fire	11,370 Acres

(Does not include harvest acres already incorporating a Burn Prescription)	
Total Upland Acres Treated (Includes Tractor, Skyline, Helicopter, Pre-commercial Thin & Pre-commercial Thin not Associated with Timber Harvest, and Prescribed Fire acreage)	22,011 Acres
Aspen Stands	
Removal of Conifer	25 Sites
Associated Volume	35.5 MBF
Hand Pile and Burn	25 Sites
Buck & Pole Fence	13 Sites @ 19 Acres
Plastic Fence	12 Sites @ 11 Acres
Delineated Old Growth	
Additional Dedicated Old Growth Acres	115 acres
Additional Replacement Old Growth Acres	1,773 Acres
Additional Pileated Woodpecker Feeding Acres	747 Acres
Noxious Weeds	
Manual Treatment	4 Sites @ 0.4 Acres
Chemical Treatment (Herbicides)	6 Sites @ 1.5 Acres
Roadless Areas	
Mechanically Treated Acres (Dixie Only)	875 Acres Harvest
Prescribed Fire (Dixie and Greenhorn Mountain)	1,495 Acres

Table 4 Recommended Action—Infrastructure Projects.

Roads	
Total Road Miles	219 Miles
Total Road Density	2.8 mi/sq. mi.
Reconstructed Roads	165 Miles
Decommissioned Roads	67 Miles
RHCA Decommissioned Roads	24Miles
RHCA Reconstructed Roads	23 Miles
Trails and Trailheads	
Decommissioned Trails	1.7 Miles
Reconstructed Trails	8.3 Miles
Constructed Trails	2.3 Miles
New Trail Heads	2 Trail Heads
Removed Trail Heads	3 Trail Heads
Dispersed Camp Sites	
New Dispersed Camp Areas	3 Camp Areas
Improved Dispersed Camp Areas	2 Camp Areas
Removed Dispersed Camp Areas	3 Camp Areas

1.2 Purpose and Need for Action

The Forest Service has found with the *Galena Watershed Analysis* and recent field reconnaissance that hydrologic and vegetation resources within the *Southeast Galena Analysis area* exhibit undesirable conditions, which are described in section 1.2.1 Undesired Conditions, page 8. Because of these undesired conditions, the Malheur National Forest has determined the need to:

- Improve riparian conditions in reaches of streams that do not presently have the ability to meet Riparian Management Objectives[15] (RMOs). Recommended activities would fall under the category of **Aquatics Projects** and relate to hydrology and fisheries needs;
- Improve the health, vigor, and resiliency of forest vegetation by actively managing them toward an Historical Range of Variability (HRV)[16]. Recommended activities would fall under the category of **Vegetation Projects** and would relate to forest stands, old growth areas, understory vegetation, noxious weeds and aspen needs;
- Reduce impacts from roads, trails, and camping facilities, specifically impacts to water quality, fish habitat, and wildlife habitat. Recommended activities would fall under the category of **Infrastructure Projects.** While these activities benefit aquatic resources, they are related to infrastructure and are tracked separately.

These above needs equate to the following broader statements that capture succinctly the purposes or objectives of this document (Galena WA, Supplement—2002).

- Stream channels and upland slope hydrologic processes will begin a properly functioning condition (PFC)[17] critical for healthy ecosystems.
- Forest stands and associated vegetation will begin to exist within an Historical Range of Variability (HRV) promoting a landscape that is becoming resilient[18] to natural disturbances such as severe wildfire, insect infestation and disease infection.

Proper hydrologic function and a range of desired vegetative conditions would be achieved over time, while simultaneously protecting, and sustaining wildlife and fish species, and supporting the principle of multiple use.[19]

In assessing recommendations from the *Galena Watershed Analysis* and recent field reconnaissance, seven undesirable resource conditions were identified, which were considered for restorative treatment now, rather than at a later time. Table 5, below, summarizes these seven undesired conditions, which

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[15] **Riparian Management Objectives—**Implementation of Interim strategies for managing anadromous Fish-Producing Watersheds in Eastern Oregon and Washington, Idaho and Portions of California. (Also referred to as PACFISH)

[16] **Historical Range of Variability (HRV)—**The natural fluctuation of ecological and physical processes and functions that would have occurred during a specified period of time. This document refers to the range of conditions that are likely to have occurred prior to settlement of the analysis area by Euro-Americans (approximately the mid 1800s), which would have varied within certain limits over time. HRV is discussed in this document as a reference point, to establish a baseline set of conditions for which sufficient scientific or historical information is available to enable comparison to current conditions. From *Interior Columbia Basin Ecosystem Management Project* Supplemental Draft EIS glossary definition.

[17] **Properly Functioning Condition (PFC)—**Riparian and wetland areas [and upland areas where applicable in this analysis area] achieve Proper Functioning Condition when adequate vegetation, landform, or large woody debris is present to dissipate stream energy associated with high water flows. This reduces erosion and improves water quality; filters sediment, captures bed load, and aids flood plain development; improves floodwater retention and ground water recharge; develops root masses that stabilizes stream banks against cutting action; develops diverse ponding and channel characteristics to provide habitat and water depth, duration and temperature necessary for fish production, waterfowl breeding, and other use; and supports greater biodiversity. The functioning condition of riparian and wetland areas is a result of the interaction among geology, soil, water, and vegetation. From *Interior Columbia Basin Ecosystem Management Project* Supplemental Draft EIS glossary definition.

[18] **Resilient-Resiliency**—The ability of a system to respond to disturbances. Resiliency is one of the properties that enable the system to persist in many different states or successional stages. From *Interior Columbia Basin Ecosystem Management Project* Supplemental Draft EIS glossary definition.

[19] **The Multiple Use Sustained-Yield Act of 1960**— This act confirms the principle that all forest uses are of equal importance and should not damage the ability of the land to serve future generations. This act requires that National Forests be administered for "multiple use and sustained yield of the several products and services obtained there from," (16 USC 531).

are now considered "ripe for decision." This table also contrasts each undesired condition with a desired condition, which can be viewed as a project objective or desired outcome. Following this table under section 1.2.1 Undesired Conditions, descriptions of the seven undesired conditions are discussed in more detail. This is followed by section 1.2.2 Desired Conditions, which describes conditions which would rectify the existing undesired conditions. By taking into consideration these conditions, a better understanding of the contrast (or the discrepancies between these conditions), will show the basis of the underlying Purpose and Need of this proposal.

Table 5 Undesired Condition/Desired Condition matrix

UNDESIRED CONDITONS	DESIRED CONDITIONS
1.2.1.1—Across the landscape, peak stream flows in early spring are intensified, reducing water availability for late season flows (see page 8).	**1.2.2.1**—By implementing aquatic, vegetation and infrastructure projects, cool water is held for longer periods across the landscape of the analysis area and available in late summer/early fall for fish and wildlife species. (see page 21).
1.2.1.2—A number of streams do not meet State standards and are listed on the State of Oregon 303(d) List of Water Quality Limited Waterbodies (1998) Federal Clean Water Act (see page 10).	**1.2.2.2**—With aquatic and infrastructure projects, improved habitat conditions and lowered temperatures for streams within the analysis area are in a manner that sustains viable populations of threatened fish species (see page 22).
1.2.1.3—Some stream segment conditions are outside an expected range for fish species (see page 11).	**1.2.2.3**—By implementing aquatic and infrastructure projects, damaged stream segments within the analysis area are repaired and habitat is created that improves and sustains viable fish populations (see page 22).
1.2.1.4—Vegetation conditions are outside the Historical Range of Variability (see page 14).	**1.2.2.4**—By implementing aquatic and vegetation projects, resilient patterns of forest stands incorporating multi-resource habitat needs dominate the landscape in a mosaic that has the ability to withstand the endemic disturbance regimes of insect infestation, disease infections, and low intensity wildfire. (see page 21).
1.2.1.5—Uncharacteristically severe wildfires are likely to occur in Dry and Moist Forest types (see page 17)	**1.2.2.5**—By implementing vegetation and infrastructure projects, fire adapted forest stands once again dominate the landscape in a mosaic pattern where wildfires normally burn with low intensity over most of the area in Dry and Moist Forest types. (see page 25).
1.2.1.6—Terrestrial wildlife habitat is currently degraded or missing essential components because of past activities.(see page 18).	**1.2.2.6**—By implementing aquatic, vegetation and infrastructure projects, resilient patterns, corridors, linkages, and forest stands once again dominate the landscape and are resilient to endemic disturbances and provide proper structure and cover for wildlife. (see page 27). .
1.2.1.7—Noxious weeds are invading the ecosystem and displacing native species (see page 20)	**1.2.2.7**—The landscape is free of noxious weeds and native vegetation is vigorous and resistant to future weed invasion. (see page 28).

1.2.1 UNDESIRED CONDITIONS

The following seven undesired conditions, were originally identified in the Galena EAWS as opportunities with subsequent recommendations which could be resolved through treatment. These following sections describe why a need exists in the analysis area, and why treatment should occur now rather than at a later time. Recommendations have been brought forward through this document (Galena WA, Supplement—2002) as described under the Recommended Action beginning on page 2. These projects are one way to help move or accomplish the desired conditions as described in 1.2.2 , page 21.

1.2.1.1 Undesired Condition: Early Season Peak Flows

Across the landscape, peak stream flows in early spring are intensified, reducing water availability for late season flows.

Snow melt and summer storm runoff are leaving the landscape too fast in the analysis area. Peak and near peak flows are longer in duration and the total early season flow is greater than in an undisturbed landscape. Late summer base flows are smaller and the duration of low flows is longer. Elevated peak and near peak flows occur because channels have been down cut and are no longer connected with flood plains or side channels. Other factors contributing to elevated flows include:

Photo 1—Hydraulic mining was prevalent in the analysis area.

- Upland soil loss and degradation during mining and early grazing practices prior to and at the turn of the 19th and 20th Centuries;
- The loss of large woody debris in streams due to early logging and other management practices; the loss of riparian hardwoods due to changes in the water table;
- Historic livestock over-grazing (prior to the 1950's) which has led to soil compaction and loss of cover;
- The loss of a natural meandering nature of streams;
- A reduction in naturally occurring vegetation along the riparian areas of streams due to many factors;
- Most recently (since the 1940s), roads have intercepted both overland water flow and groundwater across the landscape, concentrating runoff that would have otherwise been

absorbed and filtered by forest vegetation. Additional soil compaction of landing sites from logging operations is a factor in increased runoff of surface water across the landscape.

Photo 2—From approximately 1905 through the 1940s railroad logging occurred throughout most of the analysis area (see Appendix E, Map 4—Historic Railroad Logging). Courtesy Harney County Historical Museum

Additionally, there is a vulnerability of soils to erosion following storm events of high intensity and short duration. The John Day basin is recognized as having some of the most intense two hour rainfalls in the State of Oregon. This may place areas that have lost ground cover (or infiltration capacity) from historical grazing and other disturbances, at a higher risk than those areas where frequent summer storms do not occur (Galena Watershed Analysis 1999).

Historic increased peak flows have contributed to stream channel down cutting, which has in some instances, disconnected floodplains from the water table. These floodplains no longer act as "sponges" which, formerly captured surface flow. These floodplains no longer store ground water for late season release. Additionally, the removal of beaver from the analysis area has contributed to the decrease of wetlands associated with beaver dams. The construction of beaver dams retained water on the landscape year-round.

This has led to an undesirable condition across the landscape of the analysis area. Late summer base flows are smaller, and the duration of low flows is longer. Some stream segments in the analysis area go dry in summer months because of factors previously described.

Roadless Areas

Within the Dixie and Greenhorn Mountain Roadless Areas, management in the past 100 years has substantially altered the drainage network (including uplands) and its behavior over approximately half of this area. While the undesired conditions described in this section, may not be as severe in the designated roadless area these conditions are nevertheless present.

Compare the previously described undesired condition with following sections in this document (Galena WA, Supplement—2002) 1.2.2.1 Desired Condition: Lower Peak Flows, page 21 ; Chapter 3—Affected Environment, ***3.2.1—Early Season*** Peak Flows*, page 113;* ***3.3.0 Roadless Character****, page 204 and Chapter 4—Environmental Consequences,* ***4.2.1 Treatment Objectives for Early*** Season Peak and Near Peak Stream Flows *, page 239.*

1.2.1.2 Undesired Condition: High Stream Temperatures

A number of streams do not meet Federal Clean Water Act standards and are on the State of Oregon 303(d) List of Water Quality Limited Water bodies (1998).

Under the Clean Water Act (CWA) the primary beneficial use in the analysis area is fish habitat. Other beneficial uses include: irrigation withdrawals and State Scenic River and other aesthetic uses. Segments of seven tributary streams and the Middle Fork of the John Day river, are on the 1998 State Water Quality Limited 303 (d) List[20] for temperature (fish rearing). The Middle Fork of John Day River and the lower segments of many of its tributaries exceed the State standard for temperature (a standard for fish rearing) of 64º(F), over 45 days of the year. Granite Boulder Creek exceeds the State standards for temperature (a standard for bull trout). At higher elevations (over 5000 feet) this temperature standard is exceeded in analysis area streams on an average of less than 6 days per year. In August through September, temperatures in the Middle Fork have been recorded in the 80°s (F), with temperatures staying in the upper 70°s (F) for several weeks. The mainstem of the river is also listed for flow modification based on withdrawals granted by water rights. A need exists to reduce or maintain lower stream temperatures by increasing riparian vegetation in a manner that mimics historic patterns, which shade streams in the analysis area. At least 4 miles of existing hardwood vegetation is currently being heavily browsed in manner that precludes any shade benefit to these streams. Additionally, twenty-five aspen sites have been identified in dramatic decline, further reducing stream shade in these areas.

Loss of ground water storage and reduced base flows in summer (see page 8), flow modifications, reduced stream shade, increased wetted channel width-to-depth ratios,21 declining aspen stands, which assist in riparian storage, and diminished pool frequency and pool volume contribute to elevated stream temperatures. For fish bearing streams several parameters affecting stream temperature do not meet Land and Resource Management Plan standards based on surveys that followed the Region 6 Stream Survey Protocol (USFS 1996). Analysis indicates that about 70% (approximately 50 stream miles) of surveyed streams do not meet Land and Resource Management Plan standards 22 for shade (see 3.2.2—Stream Temperatures, page 124). It is estimated that 50-70% of the analysis area's streams do not meet Land and Resource Management Plan standards for wetted channel width-to-depth ratios. It is also estimated the 70-90% of the areas streams do not meet Land and Resource Management Plan standards for pool frequency. The condition of small perennial and intermittent streams and ephemeral draws contributes to elevated stream temperatures. It is estimated that of the small perennial streams, 70% do not meet shade standards. About 50% of intermittent streams and ephemeral draws have conditions (see 3.2.1—Early Season Peak Flows, page 113) which contribute to accelerated runoff and thus contribute to elevated stream temperatures.

[20] State of Oregon, Department of Environmental Quality's 1998 Section 303 (d) for stream temperature and minimum flow requirements. The 1972 Federal Clean Water Act (CWA) in Section 303 (d) requires each State to identify those waters for which existing required pollution controls are not stringent enough to achieve that State's water quality standards. Within the Southeast Galena analysis area this section of the Middle Fork John Day River is currently listed in Oregon's 1998 Section 303(d) list for exceeding both stream temperature standards and summer flow minimums.

[21] Width-to-Depth Ratio: Low stream channel wetted width-to-depth ratio helps to maintain cooler temperatures by making less sunlight present on the water surface in streams.

[22] LRMP Amendment 29

Photo 3—Logging (railroad and truck logging) occurred through the 20th Century and once supplied two mills that were built to process lumber from the greater Galena Watershed.

Past logging (see Logging, page 210) and mining activities (see Mining, page 209) have straightened channels, reduced shade and reduced the level of woody debris in riparian areas. Historic changes in the landscape, including a lack of riparian forest canopy and a loss of riparian vegetation, contributed to water temperatures being elevated and to the loss of water in riparian storage, which once effectively regulated water flow evenly through the year. Past management activities and natural events have created a condition where a rapid movement of water off the landscape occurs every year, contributing to high stream temperatures. The seven tributaries and the Middle Fork John Day are streams within the analysis area listed on the State 303(d) list, which is prepared by the State of Oregon's Department of Environmental Quality. This list identifies streams in non-compliance with the Federal Clean Water Act. These aquatic habitat conditions have focused attention on the undesired conditions of high stream temperatures as well as the low, late season water flows, as described above, and their relation to potential effects on threatened fish species.

Roadless Areas

Within the Dixie and Greenhorn Roadless Areas, the alteration of the drainage network from past management activities (described in1.2.1.1 Undesired Condition: Early Season Peak Flows, page 8) contributes to elevated stream temperatures in reaches below these areas. While the undesired conditions described in this section may not be as severe in the designated roadless area, these conditions are nevertheless present.

Compare the previously described undesired condition with following sections in this document (Galena WA, Supplement—2002) 1.2.2.2 Desired Condition: Lower Stream Temperatures page 22; Chapter 3— Affected Environment, 3.2.2—Stream Temperatures, page 124; Chapter 4—Environmental Consequences, 4.2.2 Treatment Objectives for High Stream Temperatures, page 253; and 3.3.0 Roadless Character, page 204.

1.2.1.3 Undesired Condition: Damaged Aquatic Habitat

1.2.1.3—Some stream segment conditions are outside an expected range for fish species.

Steelhead trout and bull trout are present in the analysis area and are listed as Threatened under the Endangered Species Act, (see pages127 and 128). Additionally, Chinook salmon and redband trout also present in the analysis area, and are listed as a sensitive species, (see page 129). Vegetation shade

that helped maintain cooler water temperatures that are necessary for these threatened species was more widespread and diverse before settlement by Euro-Americans when aspen and cottonwood stands were more prevalent throughout the analysis area (*Galena Watershed Analysis*). Before settlement, most stream segments in broad valley bottoms also had a natural tendency to meander slowly through the watershed, holding water at cooler temperatures with a dense streamside vegetation cover and an old forest canopy providing shade and bank stability on streams in the area. Historic mining, grazing, and logging have contributed to a change in vegetation type throughout riparian areas as well as upland areas in the project (see 3.2.4 Vegetation by Forest Type, beginning on page 139). Many detrimental conditions for fish in the analysis area streams and the causes of these unfavorable conditions are described in 1.2.1.1, page 8 and 1.2.1.2, page 10. There are no fish hatcheries in the John Day basin which is listed as containing 5 of the 23 healthiest salmon and steelhead stocks in the entire state of Oregon (Huntington 1994). Therefore, all activities affecting fisheries in this system are controversial in nature, due to the presence of wild stocks of steelhead trout and bull trout.

As described in 1.2.1.1 Undesired Condition: Early Season Peak Flows, page 8 the reduction of late season flows equates to smaller streams going dry during summer months, thereby impacting the fall spawning activities of bull trout during the low flows in August through November. Smaller streams are important because these tributaries of the Middle Fork of the John Day River maintain clean water and cool water temperatures for all salmonid species, all of which are in need of high quality rearing habitat during late season flows. Wildlife movement is also impacted across the landscape when wildlife is searching out these denser vegetative areas containing pools of water and relief from heat (see 1.2.1.6 Undesired Condition: Degraded Wildlife Habitat, page 18).

The Middle Fork of John Day River and many of its tributaries exceed the State temperature standard of 64ºF, over 45 days of the year. This occurs through late season flows when bull trout spawn. Water temperatures for bull trout spawning and steelhead trout rearing is vital for these threatened species. Bull trout spawn from August through November requiring optimum water temperatures of 48°F or below. Rearing temperatures for bull trout are 54ºF or below. Optimum steelhead rearing temperatures are less than 64ºF. Spawning temperatures are rarely an issue for steelhead, as this species spawn in the spring when streams exhibit lower temperatures due to surrounding air temperature and ample water from snowmelt runoff.

Pools have been reduced in part due to the removal of riparian vegetation from past logging reducing potential wood debris, past hydrologic mining eliminating vegetation, and extraction of beaver. Beavers played a role in slowing water, providing natural impediments to peak flows and sediment transport as well as providing deep pool habitat for fish. Beavers were removed from eastern Oregon and the analysis area through trapping by the late 1800s (Lichatowich 1999). However, small numbers of these animals have returned to the analysis area (see Beaver Activity, page 136).

Pool to riffle ratios of a range of 1 pool to 1 riffle to 1 pool to 1.5 riffles (1:1 to 1:1.5) are considered excellent fish habitat. Pool to riffle ratios of streams which are greater than 1 riffle to 1.5 pools (1:1.5) indicate reduced pool habitat and are considered riffle ratios, which are not properly functioning. Only 10% of fish bearing reaches in the analysis area have pool to riffle ratios of 1:1 to 1:1.5. The pool to riffle ratios of 90% of fish bearing reaches in the analysis area have pool to riffle ratios greater than 1:2.3. Past efforts by the Forest Service of building log structures in streams (in-stream structures) to improve pool quality and quantity have begun to deteriorate and many of these older structures are in need of repair with several actually widening stream channels and others creating barriers to fish movement at low flows.

Classified roads in the analysis area are contributing to stream sedimentation, increased stream temperature, and reducing fish habitat quality and quantity. Continued use of roads that cause sedimentation is not compatible with aquatic habitat resources. In some instances, the use of unsurfaced roads during wet weather in spring and fall is adding to stream sedimentation.

Photo 4—Native surface roads during wet weather in spring and fall are contributing to accelerated runoff, stream turbidity and sedimentation.

Due to insufficient funds to maintain or upgrade all roads, the condition of some roads would continue to deteriorate and potentially contribute sediment to streams unless appropriate actions such as reconstructing, decommissioning, relocating or closing of roads takes place.

There are approximately 267 miles of existing open and closed roads (this includes all Forest classified roads[23] and road under other jurisdiction). Of these roads, there are approximately 60 miles of roads located in Riparian Habitat Conservation Areas (RHCAs) of which about 33 miles are left open that may be contributing sediment to nearby drainages. These aforementioned conditions when combined with the factors of the undesired conditions outlined in 1.2.1.1 and 1.2.1.2 are degrading fish habitat. Currently total road density within the analysis area is about 3.45 miles per square mile. The USFWS in 1998 and NMFS in 1996 have developed a matrix that rates watershed health for fish pathways and indicators for bull trout and steelhead, respectively. Subwatershed with road densities over 2.4 miles per square mile are considered as functioning at an unacceptable risk for bull trout whereas over 3 miles per square mile is considered as functioning at an unacceptable risk for steelhead.

Roadless Areas

As expressed above and in 1.2.1.1 and 1.2.1.2, the same impacts and concerns are evident within the Dixie and Greenhorn Mountain Roadless Areas. Aquatic habitat has been altered and is not functioning as described in 1.2.2.3 Desired Condition: Functioning Aquatic Habitat, page 22. As with the other undesired conditions, these concerns tend to be in the lower half of the Roadless Areas but can be seen in some of the higher elevations as well.

Compare the previously described undesired condition with following sections in this document (Galena WA, Supplement—2002): 1.2.2.3 Desired Condition: Functioning Aquatic Habitat, page 22; Chapter 3—Affected Environment, 3.2.3 Aquatic Habitat page 125; 3.3.0 Roadless Character, page 204 and Chapter 4—Environmental Consequences, 4.2.3 Treatment Objectives for Aquatic Habitat, page 255.

[23] **Classified road.** A road wholly or partially within or adjacent to National Forest System lands that is determined to be needed for long-term motor vehicle access, including State roads, County roads, privately owned roads, National Forest System roads, and other roads authorized by the Forest Service. If a system road is no longer necessary for long-term resource management it is considered a candidate for decommissioning.

1.2.1.4 Undesired Condition: Vegetation Outside Historical Range of Variability

Vegetation conditions are outside the Historical Range of Variability.

Current stand structure and tree species composition are not meeting the HRV (see definition page 6), particularly in the Old Forest Single Strata[24] (OFSS) structural stage. Present growth conditions and stand structures are not on a trajectory to increase the early seral species, or to restore the large tree component (open park-like stands) that is lacking across the landscape. Over 50% of the ponderosa pine and western larch forest stands (Dry Forests[25]) are not within the HRV. These forests were once more open and park-like in appearance, dominated by early seral tree species such as ponderosa pine and western larch. Even the mid elevation Moist Forest types (Douglas-fir and grand fir) were less dense and more resistant to major disturbance events such as insect, disease, or fire than they are at present.

Photo 5—Open and park-like stands of large fire-resistant trees such as these were once prevalent throughout the analysis area(OFSS).

Due to fire suppression and past logging practices (see, page 210), the character of the forest has changed in the analysis area, as it has throughout the Blue Mountains. There are fewer large, fire resistant trees and many more smaller trees in forest stands. These Dry Forests have become more susceptible to uncharacteristically severe wildfire, disease and insect infestation.

In the Dry Forest types, (about 58% of the analysis area), only 1% of the area is now Old Forest Single Strata (OFSS). This open park-like stand structure, now present only as a remnant, was once representative of historical stand conditions which was stocked with primarily fire tolerant species, ponderosa pine and western larch. These fire adapted forests (OFSS) once comprised 30 to 55% of the landscape, dominating the analysis area.

[24] **OFSS** See Stand Structure Definitions page 145

[25] see 3.2.4.1 Dry Forest Type, page 140.

Photo 6— Due to fire suppression and other activities, the character of the forest in the Analysis area has changed, as it has throughout the Blue Mountains.

The Moist Forest types (about 23% of the project acres) is not as far out side of the HRV as the Dry Forests. Formerly OFSS comprised up to 15% of the Moist Forest where today, OFSS makes up about 5% of the Moist Forest type(see Appendix E, Map 7 Forest Stand Structural Stages). The exclusion of fire has allowed grand fir species to reproduce and proliferate in the shade of remaining larger ponderosa pine and western larch. The lack of fire has allowed this reproduction of grand fir to create high densities of fire-susceptible trees. Formerly, low intensity cooler smaller-scale fires periodically would under burn these areas in small patches creating larger trees in open park like stands (Agee, 1993). Now, fire-susceptible forest stands dominate 99% of the landscape of the Moist Forest portion of the analysis area.

Chapter 3 of this document (Galena WA, Supplement—2002) discusses in more detail the analysis area's current stand structure including age classes and how it relates to the HRV (see 3.2.4 Vegetation , page 139).

Quaking aspen stands are isolated, declining, and smaller in numbers than they were historically. According to recent research, aspen stands are less than 10% of their former range and distribution (Tatum 2001). Fire stimulates aspen growth, and because of fire exclusion, few sprouts are emerging. The new shoots that do emerge are often browsed by deer, elk, and cattle. Overstocking of conifers is causing stand encroachment and shading in the remaining aspen stands. When the factors that contribute to aspen decline are combined, it is clear that current conditions are effectively suppressing any aspen regeneration. The thriving re-growth of burned and fenced stands in the nearby Summit Fire area that was prescribed in the *Summit Fire Recovery Project* (see Photo 10, page 76) attests to the viability and regenerative capacity of even small, late-to-old-structure groves of aspen when sites are protected.

Photo 7—The overstocking of stand conditions impact numerous resources in an undesired manner.(YFMS)

Understory vegetation is deteriorating in a manner similar to the aspen stands. The alteration of natural fire regimes has resulted in uncharacteristically dense shade from the overstory, decreasing the understory vegetation and ground cover. Because of the understory vegetation reduction, the availability of wildlife forage has been reduced.

Roadless Areas

Within the Dixie and Greenhorn Roadless Areas, management in the past 100 years has substantially altered Dry Forests and lower elevations of Moist Forest causing these forests to move outside HRV. Examples of these activities include railroad logging, truck logging and exclusion of wildfire. The higher elevation Moist and Cold Forest types are likely close to HRV, largely because management activities have not occurred in these areas in the same manner as in lower elevations.

Compare the previously described undesired condition with following sections in this document (Galena WA, Supplement—2002): 1.2.2.5 Desired Condition: Low Severe Wildfire Risk page 25; Affected Environment, 3.2.5 High Wildfire , page 159;3.2.4 Vegetation , page 139 Logging, page 210 Fire Exclusion Policies, page 211;3.3.0 Roadless Character, page 204 and Environmental Consequences, 4.2.5 Treatment objectives for High Wildfire , page 262.

1.2.1.5 Undesired Condition: High Wildfire Hazard

Uncharacteristically severe wildfires are likely to occur in Dry and Moist Forest types.

Uncharacteristically severe wildfires are likely to occur because fire has been excluded from forest stands for the past 100 years and most of the large fire resistant ponderosa pine and western larch has been removed. Analysis area forest stands historically existed as fire adapted forests with a fire regime of frequent, low intensity fires, particularly in large fire resistant ponderosa pine and western larch stands. With the exclusion of wildfire, hazardous fuels have accumulated. Multi-layered tree canopies are dominant across the landscape. Historically the single layered old forests (OFSS) with the open park-like conditions covered 30 to 55% of the Dry Forest type. Historically when fire entered the ecosystem, they were more frequent and low intensity ground fires due to the open park-like stands that retained very little ladder fuel to allow fire to climb into the overstory crown and were made up of fire-resistant trees. Currently, many of these areas are now multi-layered stands with accumulations of dead surface litter and thick understories of grand fir. This structure of fuel acts as a ladder connecting right into the larger tree crowns, consequently wildfires can commonly progress into high intensity crown fire, and very likely develop rapidly into a large number of acres as an uncharacteristically severe wildfire (e.g. Summit Fire, 1996, which burned adjacent to the analysis area). Fires of this type consume the organic layers of soils and kill virtually all vegetation over significantly greater numbers of acres than the low-intensity fires that occurred historically (*Galena EAWS,* Malheur National Forest, 1999 also see Appendix F this document (Galena WA, Supplement—2002)) . Uncharacteristically severe wildfires put natural resources, human safety, and local structures at unacceptable risks.

Photo 8—In 1996 the Summit Fire started on the Umatilla National Forest and burned 37,961 acres across two National Forests (see Appendix E, Map 2—Large Fire History).

Nationally, only two per cent of fires escape in a manner that would produce an uncharacteristically severe wildfire (*Roadless FEIS* 2000 p.98). However, many factors exist in the Southeast Galena analysis area that cause this area to be more vulnerable. Due to local weather patterns, fire frequency in the Galena Watershed is the highest on the Malheur National Forest. Weather patterns coupled with overstocked forest stand conditions have accounted for over one-third of the watershed in the past decade being subject to uncharacteristically severe wildfire, including the 1996 Summit Fire (see page 159), and the 1994 Reed Fire. These recent fires have burned with such intensity that the ecosystems of many of these areas have been drastically changed.

Currently, about 75% of the analysis area has conditions which are rated as a high fire hazard,[26] with vegetation conditions that indicate a crown fire may become the typical fire behavior pattern in over 60 percent of this area.

26 Fire Hazard relates to fuel accumulation or loadings while **Fire Risk** is a term relating to the probability of a fire starting,.

In 1997, in the Vincent and Vinegar Subwatersheds, a wind event blew down a substantial amount of trees over 1400-acre area. These conditions presents an additional fire-hazard from an excess of ground fuels—and may also pose a threat of a large insect infestation.

Due to these undesired fuels accumulating from overstocked vegetation conditions and (standing dead and forest floor accumulations) in and around the analysis area (excluding the recent fire occurrences) and the recorded high level of lightning strikes in the Galena area, uncharacteristically severe wildfire may spread outside the analysis area from fires originating in analysis area stands. Uncharacteristically severe wildfire could spread into the analysis area from other adjacent watersheds that are in similar conditions. Resources along with historic and contemporary structures on adjacent public and private lands are vulnerable to loss. Suppressing uncharacteristically severe wildfire under current forest stand conditions is dangerous and unpredictable for wildland fire fighters—presenting a threat to human life (see Appendix E, Map 2—Large Fire History).

Roadless Areas

Most of the conditions found in Dixie Butte and Greenhorn Mountain Roadless Areas are as in the previously described undesired condition about HRV, and in this present discussion of wildfire hazard. This equates to many of the same concerns as described above with conditions susceptible to uncharacteristically severe wildfire. This is especially true in the Dry Forest types and lower elevation Moist Forest types that have been substantially altered from past harvest, changing forest composition and fire suppression changing forest composition and structure. The Moist and Cold Forests in the upper elevation of these roadless areas provide important large, undisturbed areas for wildlife and may closely represent what occurred in these forests historically. However, while stand replacing fires are the historic fire regime for upper Moist and Cold Forest types these areas are currently in jeopardy of loss because lower elevation Dry Forests are outside HRV that uncharacteristically severe wildfire starting down slope are more likely to burn through the high elevation areas (see Roadless Areas, page16) than what occurred historically.

Compare the previously described undesired condition with following sections in this document (Galena WA, Supplement—2002): 1.2.2.5 Desired Condition: Low Severe Wildfire Risk page 25; Affected Environment, 3.2.5 High Wildfire , page 159; Logging, page 210 ; Fire Exclusion Policies, page 211; and Environmental Consequences, 4.2.5 Treatment objectives for High Wildfire , page 262.

1.2.1.6 Undesired Condition: Degraded Wildlife Habitat

Terrestrial wildlife habitat is currently degraded or missing essential components because of past activities.

Threatened, Endangered or Sensitive (TES[27]) species, Management Indicator Species (MIS[28]), and Species of Interest (SOI[29]) utilize the analysis area. Habitats for these species developed with the fire adapted forests of the past. As forest conditions moved outside of their HRV, habitat conditions for these species were also altered. A combination of management activities, including timber harvest, road construction, grazing, and fire suppression, and natural disturbances, such as wildfire and windstorms

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27 Endangered Species: An animal or plant species listed under the Endangered Species Act that is in danger of extinction throughout all or a significant portion of its range.
Threatened Species: An animal or plant species listed under the Endangered Species Act that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.
Sensitive Species: Species identified by a Forest Service regional forester for which species viability is a concern either a) because of significant current or predicted downward trends in population numbers or density, or b) because of significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution.
28 Management Indicator Species (MIS): A species used to monitor the effects of planned management activities on viable populations of wildlife and fish, including those that are socially or economically important.
29 Species of Interest (SOI): A species of high public interest or demand.

have reduced some habitats below historic levels. Particularly noted are losses in old growth[30] habitat, dead wood habitat (large snags and down logs), grass and shrub forage. High open road density elevates the potential to disturb sensitive wildlife species.

The most pronounced habitat loss is in the Old Forest Single Strata (OFSS) structural stage, as described in 1.2.1.4 Undesired Condition: Vegetation Outside Historical Range of Variability, page 14. This is a trend in forested stands throughout much of the Interior Columbia Basin, raising significant ecological concern for species that are associated with OFSS. The white-headed woodpecker is identified as an MIS in the Malheur NF *Land and Resource Management Plan*.

There is concern for potential losses to Old Forest Multi- Strata[31] (OFMS) predominantly found in the Moist and Cold Forest types. OFMS habitat has been altered from historic conditions. Some areas, such as in the Granite Boulder Subwatershed, have seen high losses in OFMS due to large wildfires such as the 1994 Reed Fire. Other areas, such as the Butte Subwatershed, have been highly fragmented by timber harvest units that create inclusions of young forests. The harvested patches average 30-55 acres in size, which diminish the value of OFMS habitat by creating more forest edge and less interior habitat. While forest edge is favored by some species such as the great gray owl, other species, such as the pileated woodpecker, pine marten and Pacific fisher, rely on contiguous habitat with little edge to avoid predators and competitors. Both the pileated woodpecker and pine marten are identified in the *Malheur Land and Resource Management Plan* (LRMP) as MIS for OFMS. The Pacific fisher is a sensitive species.

Direction in the *Land and Resource Management Plan* requires establishment of a network of Dedicated Old-Growth (DOG) areas across the Forest to provide habitat for wildlife species dependent on OFMS conditions. *Land and Resource Management Plan* direction also requires the establishment of Replacement Old Growth (ROG) areas to counter possible catastrophic damage or deterioration of dedicated old growth areas. Thirteen DOG's have been designated within the Southeast Galena analysis area to help provide a network of habitat blocks for MIS pileated woodpecker and pine marten. Existing DOG's are not always tied to logical stand or topographical boundaries. ROG's have not been established for 11 out of 13 DOG's. Pileated feeding areas have not been established for 4 out of 5 pileated woodpecker DOG's (see management direction in Dedicated Old Growth and Connectivity, page178).

The *Land and Resource Management Plan* identifies eleven MIS as indicators of dead and defective tree habitat because they create their own nesting cavities in dead or defective trees. Primary cavity nesters include such species as pileated woodpecker, white-headed woodpecker, and the three-toed woodpecker. The *Land and Resource Management Plan* specifies that to provide habitat for 100 percent potential population levels of primary cavity excavator species, i.e., it is necessary to have a minimum of 2.4 snags per acre greater than 21 inches dbh, averaged over approximately 40 acres of forested land. Currently 58% of the watershed, primarily in Dry Forest types, does not provide this required level of snag habitat. There are probably areas 40 acres in size or larger with very few or no snags, providing habitat for less than 20 percent potential population levels. Stands are in younger structural stages and consequently deficient in large diameter trees. Because stands are overstocked, individual tree growth is low. Without management is it is unlikely these stands can grow the large diameter trees required to provide a sustained flow of large diameter snags. In Dry Forest areas, population viability for primary cavity excavator species is likely to remain low. As snags eventually fall and provide down logs, any deficiency in snags, could also lead to a future deficiency in down log habitat.

Rocky Mountain Elk are identified as a MIS due to the economic and social value of these animals, and their response to changes in forest cover, forage quality and open road densities. Elk and deer numbers appear to be out of balance with forage, particularly in the amount of understory grasses and shrubs

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30 Old Growth: A forest stand compose of mature/over mature trees (150 years old or older) which provides habitat for wildlife species dependant upon mature/over mature trees. LRMP IV-105 In this DEIS old growth is subdivided into two structural stages, Old Forest single Strata (OFSS) and Old forest Multi-strata (OFMS).

31 See structural stage definitions, page 145

these animals browse upon. Growing conditions for forage plants are less favorable on many sites compared to historical conditions. This is largely a result of fire suppression, which allowed conifers to increase and shade out understory grasses and shrubs. Dry Forests occupy 28,600 acres (58% of the Southeast Galena Area).

Currently, about 50% of the Dry Forests acres are highly or moderately overstocked, causing decreased grass, forage, and shrub availability. Additionally, fire no longer acts as a rejuvenating agent; underburning invigorates many shrub and grass species and is vital to some species such as ceanothus. Hardwood tree and shrub habitats are particularly deficient, and being over-browsed. At least 21 miles of stream needs hardwood planting and protection to help restore riparian vegetation along stream banks. At least 4 miles of existing hardwood vegetation needs to be fenced. Twenty-five aspen sites are in dramatic decline.

Roads open to motorized traffic allow easy access to big game habitat. Motor vehicles and associated human activities can cause stress in some big game animals, which leads to poor distribution of animals within available habitat. Easy access on forest roads leads to reduced buck and bull escapement during the hunting season and facilitates poaching. In winter range, road densities in the Tincup/Little Butte and Granite Boulder Subwatersheds greatly exceed the Land and Resource Management Plan (LRMP)standard of 2.2 miles of open road per square mile. Currently, the Tincup/Little Butte Subwatershed has 3.9 miles of open road per square mile and the Granite Boulder Subwatershed has 7.0 miles of open road per square mile. Elsewhere, subwatersheds meet open road density standards, but do not always meet the target levels recommended by the Land and Resource Management Plan (LRMP) Record of Decision (1.5 open road miles per square mile in summer range; and 1.0 open road miles per square mile in winter range).[32] The LRMP, Record of Decision states that these target densities will be met.

Roadless Areas

Within the Dixie Butte and Greenhorn Mountain Roadless Areas, as described in two previous sections (pages 16 and 17) are outside HRV in low elevation Dry Forests and Moist Forests. Although large, unroaded areas usually provide higher quality wildlife habitat—these roadless areas are so far outside HRV, as to be unsustainable, placing wildlife species and wildlife habitat at a higher risk than when fire adapted forests were prevalent. Relatively undisturbed landscapes are important to biological diversity and the long-term survival of wildlife species are currently at risk because of these conditions. At present, approximately 75% of the analysis area have conditions which present a high fire hazard. Another uncharacteristically severe wildfire in the manner of the 1996 Summit Fire in this area would result in the losses of large blocks of wildlife habitat.

(Compare the above undesired condition with: 1.2.2.6 Desired Condition: Wildlife page 27; 3.2.6 Wildlife Habitat, page 165; and 4.2.6 Treatment Objectives for Degraded Wildlife Conditions, page 284.)

1.2.1.7 Undesired Condition: Noxious Weeds are Present

1.2.1.7—Noxious weeds are invading the ecosystem and displacing native species

Noxious weeds are difficult to manage, non-native plants which pose a threat to native plant communities. Natural controls to limit the size of noxious weed populations do not exist, so populations tend to expand rapidly at the expense of the native flora. Heavy infestations can increase fire hazards, replace valuable forage with non-palatable or less nutritious forage for both wildlife and cattle, cause economic losses to adjacent farming and ranch communities, decrease the quality of recreational

[32] The LRMP Record Of Decision states "access management planning will strive for 1.5 miles of open road per square mile area (mi/mi^2) unless these densities do not allow activities that maintain a healthy and productive Forest as envisioned in the desired future condition, or interfere with access to private land."

activities, and reduce the diversity of native plant and animal communities. Plant species listed as sensitive may be moved towards listing by loss of habitat to weed invasion. Besides reducing complexity of biological communities, weed infestations can indirectly affect water runoff and sediment yield from infested sites (Quigley and Arbelbide, 1997).

Noxious weeds have been identified in the analysis area occupying approximately 56 sites that cover a total of about 28 acres. Because these noxious species are most highly adapted to increase rapidly on newly disturbed ground (e.g. bladed roadsides, new roadbeds, logging decks, skid trails, areas of concentrated cattle use, etc.), the amount of ground disturbance (in acres) generated by the project gives a measure of potential weed spread.

Compare the above undesired condition with: 1.2.2.6 Desired Condition: Wildlife 1.2.2.7 Desired Condition: Noxious Weeds, page 28;3.2.7—Noxious Weeds , page 203; and 4.2.7 Treatment Objectives for Noxious Weeds, page 320.

1.2.2 DESIRED CONDITIONS

The following are seven desired conditions or objectives which contrast the seven undesired conditions previously discussed. These desired conditons adhere to PACFISH recovery objectives and strategies.

1.2.2.1 Desired Condition: Lower Peak Flows

Compare with 1.2.1.1 Undesired Condition: Early Peak Flows, page 8.

Table 6 Water availability.

STATEMENT OF NEED	DESIRED CONDITION
A need exists to capture and hold water into the summer/fall season making water available for fish and wildlife species during this critical time of the year.	By implementing aquatic, vegetation, and infrastructure projects, cool water is held for longer periods of time across the analysis area and is available in late summer/early fall for fish and wildlife species.

Establishing ample woody debris, increased pools, and the natural meandering nature of streams will slow early season runoff and retain water across the landscape through dry seasons when threatened fish populations need it the most. Vegetation on areas denuded from past soil degradation and compaction will be re-established by riparian and upland plantings. A diversity of vegetation, including variable tree structure, age, and species, will provide stream shade, as well as bank stability leading to improved (reduced) channel width to depth ratios. In this manner, canopy cover will move toward historic/expected levels, serving to slow snowmelt and to intercept and slow intense rainfall. Reestablishing populations of beavers through riparian habitat improvement projects will accelerate the process of raising water tables, reconnecting flood plains as well as reducing sediment and creating deep pool habitat.

Reduced road miles associated relief drainage and stream crossings will slow surface movement of water in the watershed as well as reduce sediment input to streams. After planting an appropriate array of riparian vegetation, stream banks will become stable with minor, expected channel cutting occurring. Floodplains will be reconnected to stream flows, and a resulting late seasonal flow of water will be captured and held to support viable populations of fish and wildlife.

About 3% of the analysis area (about 1,450 acres) will be re-vegetated lowering the risk of future debris torrents from occurring. This will treat upland conditions caused by historic overgrazing and similar to the conditions which existed in Lemon Creek prior to a storm event that caused a severe debris torrent.

1.2.2.2 Desired Condition: Lower Stream Temperatures

Compare with 1.2.1.2 Undesired Condition: High Stream Temperatures, page 10.

Table 7 Water temperatures.

STATEMENT OF NEED	DESIRED CONDITION
A need exists to lower stream temperatures that are on the State of Oregon *303(d) List of Water Quality Limited Waterbodies (1998)* to comply with *Federal Clean Water Act* and State standards.	With the implementation of aquatic, vegetation, and infrastructure projects, improved habitat conditions that lower and maintain stream temperatures are in a condition that sustains viable populations of fish..

The most stringently regulated beneficial use, for analysis area streams, as determined by the State of Oregon, Department of Environmental Quality, under authority of the Federal Clean Water Act of 1972 (CWA), is the proper water temperature for fish, based on species presence and needs. Distributions of seasonal flow in a desired condition would be similar to an historic environment, when temperatures of late season (late summer/early fall) flows were lower. A diversity of vegetation, similar to historic conditions, including structure, age, and tree species, would provide shade for fish, as well as stream bank stability through well-established root systems. Low stream channel wetted width-to-depth ratio helps to maintain cooler temperatures by making less sunlight available on the surface water. Proper stream bank vegetation ensures a lower ratio by keeping stream banks from eroding.

Managing habitat conditions in a manner which establishes a proper streamside vegetative cover of plant-life and proper channel conditions would result in maintaining cooler water temperatures.[33] Viable populations of threatened fish species may then become sustainable as streams systems begin to function properly. Stream temperatures may not be reduced enough to meet State standards and remove streams included on the 303(d) list for temperature because many of the streams in the analysis area flow out of the ground at temperatures of up to 60°degrees Fahrenheit. Temperature standards of 48° for bull trout spawning in these streams would be unobtainable.

By establishing even, seasonal distributions of water flow, a trend toward cooler water temperatures, similar to historic conditions, may develop over time. Greater flows during summer will assist in regaining desirable lower temperatures. Where a greater natural tendency for stream channels to meander across the landscape exists, this condition would create a larger pool to riffle ratio slowing and maintaining water temperature as it leaves the landscape. If a greater quality and quantity of large woody debris exists in streams and an increased quantity of late seasonal water flow exists across the landscape, subwatershed streams will begin to persevere with lower water temperatures as successful restoration efforts establish a properly functioning condition of hydrological processes.

1.2.2.3 Desired Condition: Functioning Aquatic Habitat

Compare with 1.2.1.3 Undesired Condition: Damaged Aquatic Habitat, page 11

Table 8 Aquatic conditions

STATEMENT OF NEED	DESIRED CONDITION
A need exists to correct damaged stream segments in a manner that demonstrates aquatic habitat conditions that are capable of sustaining viable populations of fish and wildlife species.	By implementing aquatic and infrastructure projects, riparian conditions of channel meander and diverse vegetation will be improved providing riparian habitat needed for dependent fish and wildlife.

[33] Lower stream temperatures would comply with Oregon State Department of Environmental Quality (DEQ) requirements which administers the Clean Water Act (CWA) for protection of waters in the State of Oregon (Oregon Administrative Rules, Chapter 340-41) and comply with the Malheur National Forest *Land and Resource Management Plan* (*Forest Plan;* p. IV-39).

Aquatic habitat in the Southeast Galena Analysis area will function in a proper condition including adequate late season stream flows (described in 1.2.2.1), cooler water temperatures (described in 1.2.2.2), ample woody debris, a greater pool frequency, suitable stream meander, stable stream banks and desired stream side shade.

Fish of particular concern that utilize the analysis area drainages are bull trout and steelhead, which are currently threatened fish species.[34] Greater habitat complexity (including pool quality and quantity) will benefit all salmonids in the analysis area by increasing summer and winter rearing habitat. A diversity of vegetation, including vegetation structure, age and tree species, will provide shade for maintaining water temperature, as well as improve stream bank stability, and provide hiding cover that will benefit threatened fish species. Some of this riparian vegetation will eventually become large woody debris that creates pool habitat and provides hydrologic control. Pool riffle ratios will increase as will the amount of deep pool habitat to provide high quality habitat for both resident and anadromous salmonids. Increased beaver activity in analysis area streams will also improve fish habitat.

Bull trout, which spawn in late summer and early fall when stream temperatures are highest, will have no thermal barriers to movement and would have greater potential spawning areas with lower temperatures and greater base flows. In the Southeast Galena Analysis area under future, desired optimum conditions—lower water temperatures will enable bull trout to spawn in water temperatures of 48ºF or below from August through November. Rearing temperatures for bull trout will be maintained at 54º F or below. Optimum steelhead rearing temperatures are less than 64ºF. therefore, maintaining waters for bull trout will provide optimum-rearing conditions for steelhead. By managing for bull trout, the analysis area over time will establish a vegetative vigor and trend where spawning and rearing habitat will once again be provided where this species historically resided. Spawning and rearing temperatures for steelhead will also be within an acceptable range in the spring when water temperatures are not likely to be an issue and that the rearing temperatures for steelhead is higher than the rearing temperatures for bull trout.

Open and closed roads would be properly maintained and would be hydrologically disconnected to the extent practical, sediment sources are minimized and culverts would be suitably sized and positioned so that fish can pass through unobstructed. Reducing road miles across the landscape will in time increase native vegetation and reduce sediment delivery to drainages. By implementation of successful restoration efforts, properly functioning hydrologic conditions will exist throughout the analysis area, which include repair of damaged stream segments. Relocating and reconstructing roads and trails located in RHCAs and decommissioning of other roads no longer needed for management or private access will benefit both resident and anadromous fish.

Providing improved fish habitat conditions will support increased populations of anadromous and resident fish under direction of the *Land and Resource Management Plan* (LRMP*,* p. IV-2); a properly functioning condition will exist.

Roadless Areas

Roadless features evident in the Dixie and Greenhorn Mountain Roadless Areas would include undisturbed soil and water resources displaying healthy watersheds that catch, store, and safely release water over time, protecting downstream environment and serving to maintain abundant and healthy fish and wildlife populations.

[34] The Malheur National Forest *Land and Resource Management Plan* (Forest Plan) states, "efforts are to be made to manage fish habitat and riparian areas to achieve increases in fish habitat capability," (p. IV-17). The Forest Plan continues, "to manage riparian areas to protect and enhance their value for wildlife…" (p. IV-62). "Critical habitats, and other habitats necessary for the conservation of threatened or endangered species, will not be destroyed or suffer adverse modification,"(p. IV-17).

1.2.2.4 Desired Condition: Forest Stands Moving Toward Resilient Conditions

Compare with 1.2.1.4 Undesired Condition: Vegetation Outside Historic Range of Variation page 14.

Table 9 HRV

STATEMENT OF NEED	DESIRED CONDITION
A need exists to alter deteriorating forest stands across the landscape, moving conditions toward historical forest stand structures, composition, and density in a resilient manner and range that withstands endemic, natural disturbance factors such as disease infection, insect infestation and low intensity wildfire.	By implementing vegetation projects, resilient patterns of forest stands incorporating multi-resource habitat needs dominate the landscape in a mosaic that has the ability to withstand the endemic disturbance regimes of insect infestation, disease infections, and low intensity wildfire.

Forest stands would move toward the Historical Range of Variability (HRV) as directed by the Regional Forester's Eastside Forest Plan Amendment #2[35] (June 1995). Forest stand sustainability and resiliency[36] would be the overall goal for stewardship of the natural resources.

Vegetation of the analysis area would begin to exist in a fire adapted condition essential for viable ecosystem components and the sustainability of resources dependent on fire at the appropriate interval, intensity, and season.

Figure 1. Existing condition

Figure 2. Desired Condition

Resilient plant life would dominate the landscape, and possess the ability to withstand common disturbance patterns of insect infestation, disease infections, and low intensity wildfire. A mosaic of stands in various stages of development would cover the landscape— patterned as a fire-adapted forest. The lower elevation Dry Forest type (which includes higher elevation south facing slopes) is predominantly Old Forest Single Strata (OFSS) dominated by large ponderosa pine and western larch that are adapted to frequent, low intensity fire. The Moist Forests would be composed of a patch work of open stands of ponderosa pine, western larch, Douglas-fir, and grand fir with a larger portion of forest stands with higher understory densities of Douglas-fir and grand fir than the Dry Forests. Aspen stands would include early and middle structural stages in their composition. Under burning would stimulate production in the same manner. The opening of conifer stand structure near aspen groves would allow light for growth of suckers giving rise to new generations of aspen. Browsing of young shoots by deer, elk, and cattle will be reduced.

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[35] **Forest Plan (LRMP) Amendment No. 2:** Interim Management Direction Establishing Riparian, Ecosystem and Wildlife Standards for Timber Sales, Also referred to as *Regional Forester's Eastside Forest Plan Amendment No. 2.*

[36] Resiliency is the ability of the ecosystem to respond to, or recover from disturbances. The major disturbances affecting the analysis area include, fire, insects, and disease. Tree species composition and forest structural stages are factors that influence the resiliency of the forested component of the ecosystem.

A mosaic of open park-like stands with pockets of more densely spaced trees, predominately in the Dry Forest types, effectively provides more forage and interspersed cover for game animals. Open canopies in Dry Forests would allow a greater diversity of understory plant species to thrive. Periodic low intensity fires (both natural and prescribed) would stimulate renewal of these same fire adapted species.

Roadless Areas

In the Dixie and Greenhorn Mountain Roadless Areas the desired conditions would be as stated above in terms of meeting HRV however, keeping in mind that the area has been subject to management during the past one hundred years and effects from railroad logging and mining will be present for some time. In viewing the Dixie and Greenhorn Mountain Roadless Areas from a distance, the quality of a natural-appearing landscape would be apparent due to the appearance of a natural appearing contiguous forest canopy. However, in walking through the area where past logging practices have occurred during the past one hundred years, evidence of treated areas and old railroad grades and tree stumps would be perceptible as they are presently.

1.2.2.5 Desired Condition: Reduced Risk of Severe Wildfire

Compare with 1.2.1.5 Undesired Condition: High Wildfire Risk, page 17.

Table 10 Fire Risk

STATEMENT OF NEED	DESIRED CONDITION
A need exists to change stand structure, landscape vegetation patterns, and species composition to replicate historic vegetation conditions and reduce the likelihood of uncharacteristically severe wildfire destroying multiple resources and opportunities for human use.	By implementing vegetation and infrastructure projects, fire adapted forest stands once again dominate the landscape in a mosaic pattern where wildfires normally burn with low intensity over most of the area in Dry and Moist Forest types.

A landscape resistant to uncharacteristically severe wildfire would exist predominately in the Dry Forest types. Moist Forest types would have a reduction in tree densities and a reduction in fuel accumulation when compared to current levels. The Dry Forests contain a pattern in the forest landscape that forms a mosaic of "patches," of trees that are less dense than the present overstocked levels. This includes higher proportions of fire-tolerant species such as ponderosa pine and western larch, growing in open, park-like stands (*Land and Resource Management Plan;* p. IV-10). Low elevation, Dry Forests would offer opportunities for thinning-in conjunction with prescribed fire—to contribute to restoration of wildlife habitat while making forests more resistant to uncharacteristically severe fire.

Photo 9 Thinning and prescribed fire treatments can be used in tandem to restore sustainable and resilient forests on dry sites. Changing dense forest conditions (see photo 7, page 16) to one that more closely approximates the historical (pre-settlement) composition and structure would move forest structure toward expected disturbance regimes. The area pictured above is within the analysis area (Moe TS) which was treated in 2000.

A desired condition would exhibit reduced surface and ladder fuels in a manner to preclude crown fire. Forested environments would be susceptible to wildfire of an expected intensity and size similar to an historical range, rather than uncharacteristically severe wildfires that are unpredictable and likely to occur under current conditions. Forest stands would be resistant to insect, disease, and severe fire. Prescribed fire could be used to resume an historic role wildfire has performed in the ecosystem. After meeting a range of sustainability in a desired condition in the future, natural fire which meets management objectives could be left to burn, as long as conditions meet the proper conditions. Fire will be managed to benefit resource objectives (*Wildland Fire Management Policy*, August 1998) and will establish a trend toward a fire-adapted forests that once occurred.

Under burning (the use of low intensity ground fire) is commonly used for managing mixed ponderosa pine and associated fir stands in order to reduce fir encroachment and perpetuate ponderosa pine and western larch.

Burning projects are designed to improve rangeland and wildlife habitat (*Land and Resource Management Plan*, p. IV-10) with low intensity fire that improves vegetation vigor in a manner that mimics the fire adapted forested environment that once occurred. An ongoing program of tree thinning and prescribed fire would be used to move the landscape toward an historic range of variability, improving forest health, reducing fuels, and maintaining or enhancing the old-forest structure and conditions (Regional Forest's Eastside Forest Plan Amendment #2).

Roadless Areas

Wildfire would burn in the Dixie and Greenhorn Mountain Roadless Areas from time to time, but low intensity fire would be the common outcome. Fire suppression efforts would continue with a reduced danger of crown fire igniting large contiguous blocks of wildlife habitat as the lower elevation Dry Forests and Moist Forests have begun a trend toward a Historical Range of Variability and fire regimes take on the historical beneficial role in the forest.

1.2.2.6 Desired Condition: Wildlife Habitat

Compare with 1.2.1.6 Undesired Condition: Degraded Wildlife Habitat, page 18.

Table 11 Wildlife

STATEMENT OF NEED	DESIRED CONDITION
A need exists to restore deteriorating wildlife habitats.	By implementing aquatic, vegetation and infrastructure projects, resilient patterns, corridors, linkages, and forest stands once again dominate the landscape and are resilient to endemic disturbances and provide proper structure and cover for wildlife.

Terrestrial habitat is in a condition or moving towards a condition that provides for viable populations of Threatened, Endangered and Sensitive (TES) species, Management Indicator Species (MIS) and Species of Interest (SOI).[37] This is best achieved by moving vegetation conditions and natural disturbance regimes back toward an Historic Range of Variability (HRV). Risk of catastrophic insect infestations or uncharacteristically severe wildfires is low, reducing threats to crucial wildlife habitat.

Old growth habitat is within HRV and well distributed. Dry Forest types are being managed to restore historic OFSS conditions that support dependent species such as the white-headed woodpecker. In the Moist and Cold Forest types, large, contiguous stands of OFMS provide quality habitat for a variety of dependant wildlife species including pileated woodpeckers, pine marten and Canada lynx. Where timber harvest is scheduled, Cold and Moist Forest types are managed in size blocks which mimic their fire regimes. Younger aged stands (YFMS, SECC and SEOC)[38] would be actively managed to move them more quickly toward OFMS and OFSS. Trees would be distributed in a patchy, or clumpy nature to better mimic historic conditions. Sufficient travel corridors are provided to permit movement and dispersal of animals between locally isolated blocks of old forest habitat.

Snags would be well distributed and present at levels that support 100% of the potential populations of primary excavator species. Large down logs are at historic levels. Forest insects and diseases are operating at endemic levels, killing trees in low but sufficient numbers to provide a continuous supply of snags and downed logs.

Habitat quality for deer and elk is high, particularly in winter range. There would be a good distribution of cover for thermal regulation and security, and an abundance of open stands with native grasses and shrubs for forage. Low intensity burns and thinning would be used regularly to stimulate the abundance and vigor of forest plants used for forage. Improved upland forage combined with streamside planting and protection will help reduce over-browsing in RHCAs. Riparian plantings will improve calving and fawning habitat. Good distribution of cover and forage habitat combined with reduced road density and human disturbance allow better distribution of deer and elk across the landscape and consequently, more effective use of the available habitat.

Habitat for Canada lynx meets requirements in the Canada Lynx Conservation Assessment and Strategy (Ruediger, 2000). Key linkage areas provide habitat for dispersal and movement of lynx and other large, wide-ranging carnivores between geographically isolated habitat areas throughout the Blue Mountains.

Roadless Areas

In the Dixie Butte and Greenhorn Mountain Roadless Areas, emphasis is to have these areas function as biological strongholds for populations of threatened and endangered species as well as provide large, relatively undisturbed areas for wildlife dependent on this character.

[37] *Land and Resource Management Plan*; p. IV-17, and IV 27-33.
[38] See Stand Structure Definitions page 145

1.2.2.7 Desired Condition: Noxious Weeds

Compare with 1.2.1.7 Undesired Condition: Noxious Weeds are Present page 20.

Table 12 Noxious Weeds

STATEMENT OF NEED	DESIRED CONDITION
A need exists to control populations of noxious weeds while enhancing the vigor of native vegetation to reduce future weed infestations.	The landscape is free of noxious weeds and native vegetation is vigorous and resistant to future weed invasion.

The *Land and Resource Management Plan* on page IV-45, states that managers will implement a weed control program to confine present infestations and prevent establishment of noxious weeds in new areas. Chemical treatment of infestations would be limited but would be used along with other control methods (mechanical, biological) wherever they are effective. Disturbed areas will be re-vegetated as quickly as possible with native plant species capable of resisting noxious weed encroachment. Known weed populations would shrink, and not be allowed to set seed. New sites would be inventoried regularly, and treatment results would be effectively tracked.

Roadless Areas

Communities of diverse native plants would exist in the absence of non-native invasive species due to the absence of disturbances caused by roads and accompanying activities.

1.3 Scope of this Environmental Analysis

A more complete list of past, present, and future actions considered in this analysis is found in Appendix C. The "scoping" process (described later in this Chapter) helped narrow the range of concerns or issues that were analyzed within this document (Galena WA, Supplement—2002).

1.3.1—Present Actions Leading to this Document

The 1996 Summit Fire burned across two National Forests and private lands and engulfed almost one third of the Galena watershed (37,961 acres). The Summit Fire was an uncharacteristically large and severe wildfire compared to historical fires. Forest conditions in the Southeast Galena analysis area are similar to those which generated the Summit Fire.

On July 2, 1998, a severe windstorm blew down thousands of trees over about 1,400 acres in the headwaters of Vincent and Vinegar subwatersheds[39]. Immediate concerns were the high fuel loads (about five times higher than normal) on the ground, which if a fire were to burn in this area it would be very difficult to contain as a small fire. Additional concerns were the high amount of blow down creating suitable host for spruce and Douglas-fir bark beetles, the loss of shade, the loss of soil holding capacity to the streams, and the loss of cover habitat for big-game. District personnel began an Environmental Assessment the summer of 1998 to develop alternatives in addressing these concerns. District personnel also began a Categorical Exclusion in the same year to clear hazardous conditions along open roads that had been affected by the wind event and as well to utilize materials along adjacent closed roads.

Following consultation with Forest managers, Regional Office Staff, Resource Specialists from three Tribal Governments: the Confederated Tribes of the Warm Springs Indian Reservation; Confederated Tribes of Umatilla Indian Reservation; and the Burns Paiute Tribe (see 1.3.4—Relevant Planning and Scoping); and Resource Managers from two Federal regulatory agencies, the Malheur National Forest determined that significance of the situation was far more complex than just the blow down area. The

[39] **Banner Blowdown**: This has been referred to as the "Banner Blowdown" or variously in Forest Service documents as the Banner wind event of 1998.

Forest decided to complete a watershed analysis (WA) for the Galena Watershed using the process Ecosystem Analysis at the Watershed Scale—A Federal Guide for Watershed Analysis. The goal was to analyze the condition of the whole watershed and identify opportunities that could be undertaken, which would lead to a healthier watershed under a landscape scale approach. In this analysis the Galena Watershed Analysis included effects of the1996 Summit Fire, as well as the Reed and Indian Rock Fires of 1994.

In January 1999, District resource specialists began the *Galena Watershed Analysis* and completed it in June 1999. To act on the recommendations of the *Galena Watershed Analysis*, the National Environmental Policy Act (NEPA) process started according to CFR 1500-1508.

Simultaneously, the Forest initiated the VV Beetle Containment Project, Trap Tree Salvage (Decision Memo, May 4, 1999) and VV Bark Beetle Containment Project (Decision Memo, May 7, 1999) to reduce the beetle population that was expected to emerge from the felled trees from a large wind event within the headwaters of Vincent and Vinegar Subwatersheds during the month of July in 1998. Beetles were expected to emerge from trees in the spring/summer of 1999. Attractant pheromones were used to draw insects to funnel traps and green spruce "trap" trees outside of RHCAs were felled to draw insects to the trap tree and away from the remaining standing spruce. In addition, disruptive pheromones to repel insects from heavy concentrations of remaining live spruce and Douglas-fir were also implemented. These actions were continued through 2001 and appear to have been successful in protecting the remaining trees from insect mortality.

1.3.2—Present Actions Relevant to this Document

A number of environmental analyses have been completed or are near completion which have been included within the framework of this analysis. A few of these analyses considered as cumulative effects with this analysis include M&O Environmental Assessment (Moe Timber sale), Crawford Vegetation Management Project Environmental Assessment, Olmstead Environmental Assessment, Dry Fork Environmental Assessment, Clear Creek Environmental Assessment, Summit Environmental Assessment (Pog-Pogo), and the Summit Fire Recovery Project Final Supplemental Environmental Impact Statement (see page 160), all located in the Middle Fork of the John Day River watershed. These analyses were considered to be similar in action to this Southeast Galena Restoration Project. See Appendix C for a complete listing of projects considered in this analysis, depending on the individual resource concerns and needs.

1.3.3 Future Actions Relevant to this Document

One foreseeable action that will be located within the Galena Watershed is the Northwest Galena Restoration Project. The Northwest action would be similar in scope and magnitude as displayed in the Southeast Galena Restoration Project and therefore considered to be similar in nature and included in this analysis cumulatively. To date, a project initiation letter for the Northwest Galena Restoration Project has not been completed, but is on the Malheur Schedule of Recommended Actions.

1.3.4—Relevant Planning and Scoping Dates

The National Forest Management Act (NFMA) and National Environmental Policy Act (NEPA) encourages an open process to be used to invite public participation. This can be useful in order to refine the scope of a project and to identify key or significant issues that may have been overlooked in the recommended action. The Forest Service requests information and comments from Federal, State, and local agencies, and other groups or non-governmental agencies as well as individuals interested in or affected by the recommended action. For this Environmental Impact Statement the following steps were taken as a part of public involvement.

- July 1998 through January 1999—Forest Service began discussions with the Forest Service Regional Office out of Portland Oregon to determine the scope of a potential project and type of analysis to be pursued.
- January 1999—the Malheur National Forest decided to look at the project on a landscape scale to reduce chances of another Summit Fire size disturbance and to analyze insect infestation concerns at a broader scale.
- January 1999 through June 1999—the planning process known as, *Ecosystem Analysis at the Watershed Scale—Federal Guide for Watershed Analysis* was used in developing the *Galena Watershed Analysis*, which incorporated public participation.
- May 1999 a *Decision Memo* for use of pheromones and trap trees in the Vincent/Vinegar Creek blow down area was implemented with public participation.
- On July 15, 1999, a *Notice of Intent* (NOI*)* to prepare the *Southeast Galena Restoration Project* was published in the *Federal Register*.
- On August 19, 1999, a scoping document seeking public comment was mailed to over 1,000 individuals, organizations, and agencies.
- On August 25, 1999, a notice inviting comments on the project was published in the *Blue Mountain Eagle*, one of the Malheur National Forest's newspapers of record.
- On January 28, 2000, a newsletter informing the public of projects recommended by the Malheur National Forest within the Blue Mountain Demonstration Area and included a description of the *Southeast Galena Restoration Project* and was mailed to over 1,000 individuals, organizations, and agencies.
- On April 6, 2000, Forest Managers and the Southeast Galena Analysis Team Leader met with representatives from the Burns-Paiute Indian Reservation to exchange information on aspects of this analysis.
- On April 19, 2000, Forest Managers and team members met with resource specialists from the US Fish and Wildlife Service and the National Marine Fisheries Service to discuss aspects of this project as it relates to the Endangered Species Act since this meeting there have been regular meetings to discuss the project.
- On April 21, 2000, Forest Managers and team members met with resource specialists from the Confederated Tribes of the Warm Springs Reservation of Oregon, the Confederated Tribes of the Umatilla Indian Reservation, and the Columbia River Inter-Tribal Fish Commission to exchange information on aspects of this analysis.
- On August 28, 2001, a public contact letter was sent to over 1,000 individuals, organizations, and agencies informing them that a DEIS will soon be available and asking if they prefer a hard copy, CD ROM, access the Web-Site, or removed from this mailing list.

1.4 Issues Studied in Detail

Careful consideration was given to comments received from the public, other agencies, and Forest Service resource specialists. From this scoping process, it was determined that the following 12 key issues are significant to the decisions to be made concerning the *Southeast Galena Restoration Project*. These issues directly influenced the development and technical design of the range of alternatives including the recommended action.

ISSUE 1.4.1—Restricted Access

Issue #1 Statement*: The Agency's recommended action to decommission and close a number of roads will reduce motorized access within the analysis area.*

Public use of the analysis area for recreation, or commercial uses have risen steadily. Forest access is an important issue with many members of the public; some want increased motorized access, while

others want more areas closed to motorized use to reduce impacts to fish and wildlife habitat, and develop more pristine areas.

Measures:—Total road densities per subwatershed.—Open road densities per subwatershed.—Miles of open roads per subwatershed.—Miles of closed roads per subwatershed.—Miles of decommissioned roads per subwatershed.—Miles of new roads.

ISSUE 1.4.2—Effects of All Terrain Vehicle (ATV) use

ISSUE #2 STATEMENT: *The Agency's proposal is inadequate in addressing ATV use that is causing resource damage, especially within RHCAs.*

This issue is twofold: 1) current damage caused by ATV use on existing trails; and 2) damage caused by ATV use cross country. In the past 10 years, ATV use has risen due to increased interest in horn hunting, mushroom collecting, pleasure driving, and hunting. Areas are now impacted from this increased use, especially during wet seasons.
There is evidence across much of the lower elevation landscape that ATVs are now being used cross-country. This type of use, may be adding to resource damage. By driving ATVs through drainages a possible increase in sediment occurs raising concerns for the area's anadromous threatened fish e.g. steelhead, bull trout.

Measures: —Number of improved stream/trail crossings. **—**Miles of ATV trails improved and upgraded.**—**Improved or relocated trailheads.

ISSUE 1.4.3—Effects of Ground Based Systems

Issue #3 Statement: *The Agency's recommended action of tree harvest with associated activities would cause unnecessary damage to the hydrologic function of the area's soils and streams.*

There are numerous impacts that influence hydrologic processes. In Southeast Galena, the major concerns of harvest activity impacts to the area's soils and streams.
This concern is twofold:

Concern 1: Soil compaction and, **Concern 2:** Concentration of water run-off.
The harvest activity that contributes the most to soil compaction is tractor skidding and roads direct water run-off, which contributes to stream sediment concerns. Tractor skidding, skidding networks, and the transportation system contributes to surface water interception and directs overland flows to near by drainages. These actions reduce water infiltration and increases risk of sediment transport. These impacts raise the risk of potential sediment increases to nearby streams increasing the potential cumulative impacts to fish populations.

Measures: —Acres of ground-based systems used in each alternative and specifically on sensitive soils. —Acres of skyline-based system used in each alternative and specifically on sensitive soils. —Miles of road construction per subwatershed. —Miles of road reconstructed per subwatershed. —Miles of decommissioned roads per subwatershed.—Miles of roads removed from RHCAs. —Miles of open and closed roads. —Total road density and open road density per subwatershed. —Equivalent Roaded Acres cumulative effects model.

ISSUE 1.4.4—Effects of Heavy Equipment in RHCAs

ISSUE #4 STATEMENT: *The Agency's proposal of using heavy equipment within RHCAs to create a meandering nature to stream channels, enhance aspen stands, and to place in-stream structures may damage stream channel functioning.*

Heavy equipment operating within RHCAs may compact soil, damage stream banks, and contribute sediment to streams. Access through the RHCA to the project site would also compact these sensitive soils and possibly damage vegetation and down woody material.

Measures:—Miles of stream segments with heavy equipment use.—Numbers or acres of Aspen groves treated with heavy equipment within RHCAs.

ISSUE 1.4.5—Effects of Prescribed Fire in RHCAs

ISSUE # 5 STATEMENT: *The Agency's proposal to allow prescribed fire to burn within some Riparian Habitat Conservation Areas (RHCAs) will reduce riparian vegetation, and may decrease shade and soil holding capacity.*

Burning within RHCAs carries a risk of being too intense due to existing fuel levels and ladder fuels. Fire can kill riparian vegetation reducing streamside shade and bank stability.

Measures: —Miles of RHCA boundary at risk.

ISSUE 1.4.6—Inadequate RHCA Size

ISSUE #6 STATEMENT: *The Agency's design to apply Pac Fish buffers may be inadequate in size to protect fish and their habitat.*

Some RHCAs are located in areas with soils that are more susceptible to adverse impacts from management activities e.g. Clarno[40] soil types. Additional precautions or mitigations should be taken around Category IV streams to ensure protection from possible compaction due to skidding equipment. This equipment may create more intense overland flows and potential sediment delivery to streams due to compaction.

Measures: —Acres of increased buffers. —Miles of stream side increased buffers.

ISSUE 1.4.7—Blow down in Vincent/Vinegar RHCAs

ISSUE #7 STATEMENT: *The Agency's recommended action to remove material from within RHCAs may adversely impact the riparian resource and harvest associated activities with new stream crossings may reduce riparian functioning.*

This concern is twofold:

Concern 1: The removal of material within Pac Fish buffers in the Vincent/Vinegar blow-down area where a storm event in 1998 blew down about 1400 aces of trees; and

Concern 2: The removal of material within new stream crossings.

Harvest activities within these areas may decrease current and future coarse woody debris, decrease shade to streams, and increase risk of sedimentation from logging-related activities.

Measures: —Total acres where material is removed from RHCAs.

ISSUE 1.4.8—Effects of Toxic Chemicals

ISSUE #8 STATEMENT: *The Agency's proposal to use chemicals to control competing vegetation, pocket gopher populations and noxious weeds, may pose harmful risks to aquatic and terrestrial wildlife and humans using the area.*

Some members of the public view the use of chemicals on public lands as harmful rather than beneficial to the environment with risks outweighing the short-term benefits that could be provided by other means of treatment.

[40]Clarno soil type clayey surface soils from ancient volcanic ash deposits that ranging in depth from 4-15 in. generally with higher erosion risk, absorbs less water, and holds water longer increasing road, trail and ground-based skidding problems.

The herbicides hexazinone and glyphosate are recommended to kill vegetation competing with planted seedlings. The herbicide glyphosate is recommended to be used to combat noxious weeds. Strychnine baiting and aluminum phosphide fumigation are recommended to eradicate pocket gophers that could damage seedlings. There is a contention that fish and wildlife species could be poisoned, either directly or indirectly, by exposure to these chemicals

Human exposure to chemicals could create health and safety concerns. Workers may be exposed to unacceptable levels of chemicals during application. The general public using the Forest may be exposed to chemicals following application.

> **Measures:** Acres treated for control of competing vegetation. —Acres treated for noxious weed control. —Acres treated for pocket gopher population control.— Herbicide and rodenticide toxicity and exposure levels—Rodenticide toxicity and exposure levels.

ISSUE 1.4.9—Inadequate Amount of Treatment

ISSUE #9 STATEMENT: *Current forest stand composition and structure predispose stands toward a risk of uncharacteristically severe wildfire, insect infestations, and disease infections. The Agency's recommended action does not manage enough forest stands to adequately meet the purpose of this action of returning this area to a historical range of variability for stand composition and structure.*

A large portion of the analysis area has had the large tree component of fire resistant trees removed and is densely stocked with small trees. The remaining forest is more likely to burn with increased intensity and change into an uncharacteristically severe wildfire. The remaining forest is no longer a fire adapted forest. There is a concern that silvicultural prescriptions in the Agency's recommended action does not manage enough forest stands to adequately meet the purpose of this action of returning forest stands in this area, within an historical range of variability for stand composition and structure.

> **Measures: —**Acres of overstocked Dry Forest thinned**—**Acres of understory removed**—**Acres of Dry and Moist Forest types converted from late seral species to early seral species.

ISSUE 1.4.10—Insufficient Pileated Woodpecker Habitat

ISSUE #10 STATEMENT: *The proposal does not adequately address needed habitat for pileated woodpeckers according to current scientific literature (i.e., according to a 1993 study by Bull and Hothausen).*

This concern is twofold:

Concern 1: Dedicated old-growth areas (DOGs), replacement old-growth areas[41] (ROGs) and pileated woodpecker feeding areas (PWFAs) in the recommended action are not large enough to meet habitat requirements for pileated woodpeckers (see also, Dedicated Old Growth and Connectivity, page 178). Current literature (Bull and Holthausen 1993) indicates that pileated woodpeckers may require a 900-acre home range per breeding pair rather than the 600-acre area recommended in the *Land and Resource Management Plan* . The DOGs, ROGs and PWFAs need to be expanded to provide adequate habitat.

Concern 2: The recommended action would not retain a sufficient level of wildlife snags to meet habitat requirements for this species. Pileated woodpeckers typically require higher levels of large snag habitat than many other primary cavity species. Current literature (Bull and Holthausen 1993) recommends that pileated woodpeckers may require at least 4 large snags per acre rather than the 2.4 snags per acre recommended in the *Land and Resource Management Plan* .

Measures: —Total acres of new DOG, ROG and PWFA;—number of reproducing pairs of woodpeckers which DOGs, ROGs and PWFAs could support;—number of reproducing pairs analysis area could support.

ISSUE 1.4.11—Effects on Connectivity for Wildlife

ISSUE #11 STATEMENT: *The Agency's proposal needs to manage wildlife corridors for old growth dependent species (LRMP Amendment #2 connectivity) and the Key Linkage Areas (KLA)s for wide-ranging carnivores more aggressively to reach the forest stand HRV.* (see definition, page 6).

Silvicultural prescriptions in the Agency's proposal should not be modified to accommodate habitat connectivity. Prescriptions are not within HRV in ecosystem composition and structure which would be expected under natural disturbance regimes.

Measures: —Acres treated and type of prescription applied to the KLA. —Acres treated and type of prescription applied to connective corridors.

ISSUE 1.4.12—Effects of Managing Roadless Areas

ISSUE #12 STATEMENT: *Roadless areas provide large, relatively undisturbed landscapes, which are important to biological diversity and the survival of species dependent upon the "undisturbed character," of these areas. Management would alter this character as well as the quality of dispersed outdoor recreation for undisturbed open space and natural settings.*

The Agency's proposal to treat forest stands within the Greenhorn Mountain and Dixie Butte Roadless Area may disturb wildlife which are dependent upon undisturbed character. Trails and trailheads join these areas, which may affect the quality of recreation experience for a period of time while project activities occur, and for a period of time after project implementation.

Measures: —Acres treated of mechanical treatment —Acres treated of prescribed fire.

1.4.13—Other Items Tracked but not Considered to be a "Key" or "Significant" Issue

Although these items are not key issues to the recommended action, they are still necessary for the decision maker in making an informed decision and for the public and decision maker to see how they compare across a range of potential alternatives.

Socio/Economics: Timber-harvest related employment, restoration opportunities for local communities, population, recreation use, non-timber forest products; attitudes, beliefs and values; human health and safety; American Indian Tribes; Environmental Justice; Financial Viability; Economic Efficiency.

Visuals and Visual Quality Objectives: Effects to Visual Quality are measured in terms of whether the alternatives meet the Visual Quality Objectives outlined in the Forest Plan. Effects to Landscape Aesthetics are measured in terms of positive or negative impacts to scenic integrity and ecological landscape integrity.

1.5 Applicable Legal and Regulatory Requirements and other Planning Documents

1.5.1—Applicable Laws and Treaties

- *The National Historic Preservation Act:* The Oregon State Historic Preservation Officer (SHPO) will be consulted concerning recommended activities in the *Southeast Galena Analysis area*. The Advisory Council on Historic Preservation (ACHP) will be consulted about measures to protect significant archaeological sites from adverse affects, should any be identified.
- *The National Environmental Policy Act* (NEPA), 1969*:* NEPA establishes the format and content requirements of environmental analysis and documentation. The entire process of preparing an environmental impact statement was undertaken to comply with NEPA.
- *The Endangered Species Act of 1973*, as amended: A draft biological assessment is being prepared to document effects of recommended activities on endangered and threatened species in the *Southeast Galena Analysis area*. Appropriate coordination, conferencing, and consultation with USFWS and NMFS will be completed before the FEIS is published.
- *The National Forest Management Act* (NFMA), 1976: All alternatives were developed to be in full compliance with NFMA.
- *Clean Air Act Amendments*, 1977: The Oregon State Implementation Plan and the Oregon State Smoke Management Plan will be followed to maintain air quality.
- *The Clean Water Act*, 1982: This act establishes a non-degradation policy for all federally recommended projects. The recommended action meets anti-degradation standards agreed to by the State of Oregon and the Forest Service, Region 6, in a Memorandum of Understanding (Forest Service Manual 1561.5). This will be accomplished through planning, application, and monitoring of Best Management Practices (BMPs). Site-specific BMPs have been designed to protect beneficial uses.
- *Treaty with the Walla Walla, Cayuse, and Umatilla Tribes, June 9, 1855* and
- *Treaty with the Tribes of Middle Oregon, June 25,1855:*

  "That the exclusive right of taking fish in the streams running through and bordering said reservation is hereby secured to said Indians, and at all other usual and accustomed stations, in common with citizens of the United States, and of erecting suitable house for curing the same; also the privilege of hunting, gathering roots and berries, and pasturing their stock on unclaimed lands, in common with citizens, is secured to them."

  The analysis area falls within lands which were ceded by the Confederated Tribes of the Warm Springs Reservation.
- *Public law 92-488:* This law recognizes the Burns Paiute Tribe and their reservation. As a Federally recognized tribe, the Burns Paiute Tribe retain rights of inherent sovereignty.
- *Canada Lynx Conservation Assessment and Strategy* USDA Forest Service, USDI Fish & Wildlife Service, USDI National Park Service, USDI Bureau of Land Management (2nd Edition August 2000).This Lynx Conservation Assessment and Strategy was developed to provide a consistent and effective approach to conserve Canada lynx on federal lands in the contiguous United States.

1.5.2 Planning Documents

- Malheur National Forest *Land and Resource Management Plan* (also referred to as the LRMP and the Forest Plan). *Record of Decision* (May 25, 1990), Final Environmental Impact Statement (FEIS), and the Regional Forester's Eastside Forest Plan Amendment #2 (June 6, 1995). The following Management Areas outlined in the *Land and Resource Management Plan* were used in the development of the desired conditions described earlier in this chapter. See Appendix E, Map 3—Management Areas and Roadless Areas.

  MA 1 and 2—General Forest/Rangeland: Manage for timber production and other multiple use on a sustained yield basis (MA 1) and manage for livestock forage production and other multiple use on a sustained yield basis (MA 2).

  MA 4a—Big-Game Winter Range Maintenance: Mange to maintain usable forage for elk and deer on potential winter range.

  MA 7—Scenic Area: Manage to preserve and protect the outstanding natural esthetics of the Vinegar Hill—Indian Rock Scenic Area.

  MA 13—Old Growth: Manage old growth for wildlife and plant habitat, ecosystem diversity, and aesthetic quality.

  MA 14—Visual Corridors: Manage view shed corridors with primary consideration given to their scenic quality.

  MA 21—Wildlife Emphasis Area with Non-Scheduled Timber Harvest: Manage to provide for high quality fish and wildlife habitat and water quality.

  RHCAs—Riparian Habitat Conservation Areas including MA 3b: Manage these areas toward an expectation of the characteristics of healthy, functioning watersheds, riparian areas, and associated fish habitats. RHCAs are areas of the watershed where riparian-dependent resources receive primary emphasis, and management activities are subject to specific standards and guidelines. See Appendix E, Map 3—Management Areas And Roadless Areas.

- *Region 6 FEIS for Managing Competing and Unwanted Vegetation Record of Decision (December 1988) and the terms of the Mediated Agreement (March 1989).This analysis examined ways of managing competing and unwanted vegetation on the National Forests of the Pacific Northwest Region. The effects of the options on the physical and biological environment, on human health, on social and economic conditions, and on resource management were presented.*

- Malheur National Forest, *Noxious Weed Control Project,* Environmental Assessment June, 2000 This document was prepared to control the spread and eradicated noxious weeds over time on the Forest.

- *General Water Quality Best Management Practices, USDA, Pacific Northwest Region (November 1988).* This document is was intended to facilitate understanding of Best Management Practices for protection of water quality in the Pacific Northwest Region.

- *Interior Columbia Basin Ecosystem Management Project* Supplemental Draft EIS

- *Interim Strategies for Managing Anadromous Fish-Producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California* USDA Forest Service and USDI Bureau of Land Management (February 1995).This is an interim strategy for managing anadromous fish-producing watersheds in eastern Oregon and Washington, Idaho, and portions of California.

1996 Malheur National Forest, Bear Valley Ranger District *Pocket Gopher Control Environmental Assessment*.

1.6 DECISION FRAMEWORK

After appropriate site specific NEPA is complete (Categorical Exclusion, Environmental Assessment, Environmental Impact Statement):

The Responsible Official may decide (in a Decison Memo, Decison Notice or a Record of Decison) whether or not to:

- Select the recommended proposed action,
- Select an alternative to the Recommended Action, or
- Select portions from the developed range of alternatives and combine them in a logical package as long as the combined effects are fully disclosed and understood.

In selecting one of the above options, the terms and conditions of the selection will be fully displayed and understood. Within the parameters of this decision space, it will also be determined if a *Land and Resource Management Plan* amendment would be necessary. The decision maker will take into consideration relationships of alternatives to the identified issues of this document (Galena Watershed Analysis Supplement—2002) or further site specific analysis revelant to the project proposed.

This analysis documents the results of the anticipated effects of the alternative of no action and range of potential action alternatives. From these results, the responsible official will have considered appropriate options in making sound environmental decisions and will have been properly informed from the disclosure of the anticipated environmental effects displayed in this document, or site specific analysis relevant to future proposed actions.